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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/929,714	08/13/2001	Andreas Falkenberg	2001P14844US	8927
7590	11/16/2004		EXAMINER	
			TALAPATRA, ANIKA F	
			ART UNIT	PAPER NUMBER
			2631	
DATE MAILED: 11/16/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/929,714	FALKENBERG, ANDREAS
	Examiner	Art Unit
	Anika F. Talapatra	2631

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 13 August 2001.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) _____ is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-22 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 13 August 2001 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings are objected to because in Figure 5, the output of the XOR gate should be Y'. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

2. The disclosure is objected to because of the following informalities: Page 2, line 3, has the phrase "...demodulator is base on..." This is grammatically incorrect. The corrected phrase should be, "...demodulator is based on..." Appropriate correction is required.

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3. The disclosure is objected to because of the following informalities: Page 7, line 17 refers to "...a network 120" in Figure 1. Figure 1 comprises a wireless network. Therefore, the phrase should be, "...a wireless network 120" in order to agree with the labeled drawing of Figure 1. Appropriate correction is required.

4. The disclosure is objected to because of the following informalities: Page 12, equation in line 13 should read: $Y' = X \text{ XOR } Y$, in order to agree with page 12, lines 8-11 of the specification. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claim 21 rejected under 35 U.S.C. 102(b) as being unpatentable over Kosaka et al. (U.S. Patent 5369378) (hereto referred to as Kosaka1). Kosaka1 teaches a method for modulation of a communication signal, using Differential quadrature phase shift keying (DQPSK). Kosaka1 teaches obtaining a pair of communication bits, and translating the communication bits into three bit communication bits (see Kosaka1, column 6, lines 34-68, column 7, lines 1-24, and Figure 9). Kosaka1 teaches mapping the three bit communication bits into DQPSK symbols (see Kosaka1, columns 7-9, column 10 lines 1-29, and Figure 19).

6. Claim 22 rejected under 35 U.S.C. 102(b) as being unpatentable over Kosaka et al. (U.S. Patent 5355092) (hereto referred to as Kosaka2). Kosaka2 teaches a method

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for demodulation of a communication signal, using DQPSK. Kosaka2 teaches obtaining Pi/4 DQPSK symbols and translating them into Quadrature phase shift keying (QPSK) symbols (see Kosaka2, column 2 lines 48-68, and Figure 4). Kosaka2 teaches mapping the QPSK symbols into a pair of bits (see Kosaka2, column 15 lines 58-68, column 16 lines 1-10, and Figures 6 and 22).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 2, 5, 6, 7, 8, 9, 10, 11, 12, 14, 15, 16, 17, and 20 rejected under 35 U.S.C. 103(a) as being unpatentable over Kosaka2, in view of Kosaka1.

As to claims 1, 10, and 15, Kosaka2 teaches a method and apparatus for demodulation of a communication signal, using DQPSK. Kosaka2 teaches obtaining Pi/4 DQPSK symbols and translating them into QPSK symbols (see Kosaka2, column 2 lines 48-68, and Figure 4). Kosaka2 teaches mapping the QPSK symbols into a pair of bits (see Kosaka2, column 15 lines 58-68, column 16 lines 1-10, and Figures 6 and 22). Kosaka2 does not teach a method and apparatus for DQPSK modulation. Kosaka1 teaches a method and apparatus for modulation of a communication signal, using DQPSK. Kosaka1 teaches obtaining communication bits, and translating the communication bits into three bit communication bits (see Kosaka1, column 6, lines 34-

68, column 7, lines 1-24, and Figure 9). Kosaka1 teaches mapping the three bit communication bits into DQPSK symbols (see Kosaka1, columns 7-9, column 10 lines 1-29, and Figure 19). It would have been obvious to one of ordinary skill in the art to combine the DQPSK demodulator of Kosaka2 with the DQPSK modulator of Kosaka1; a communication system must be capable of both receiving and transmitting a data signal. Therefore it would be obvious to one of ordinary skill in the art to combine the demodulator of Kosaka2, which is capable of receiving a signal, with the modulator of Kosaka1, which is capable of transmitting a signal, in order to create a functional communication system.

As to claims 2, 11, and 17, Kosaka2 does not teach translating two bit symbol into three bit symbol using XOR operation in DQPSK modulation. Kosaka1 teaches translating two bit symbol into three bit symbol using XOR operation in DQPSK modulation (see Kosaka1, column 6, lines 34-68, column 7, lines 1-24, and Figure 9). It would be obvious to one of ordinary skill in the art to use an XOR operation in DQPSK modulation, because it is well known in the art that an XOR provides the correct translation needed to translate two bit symbol into a three bit symbol, using the minimum hardware and software requirements.

As to claims 5, 12, and 20, Kosaka2 teaches using a look up table to map the QPSK symbols into a pair of bits (see Kosaka2, column 15 lines 58-68, column 16 lines 1-10, and Figures 6 and 22).

As to claims 6 and 14, Kosaka2 teaches using a look up table to map the QPSK symbols into a pair of bits (see Kosaka2, column 15 lines 58-68, column 16 lines 1-10, and Figures 6 and 22).

As to claim 7, Kosaka2 does not teach translating two communication bits to three communication bits using XOR, ADDER, and other gate logic in DQPSK modulation. Kosaka1 teaches translating two communication bits to three communication bits using XOR, ADDER, and other gate logic in DQPSK modulation (see Kosaka1, column 6, lines 34-68, column 7, lines 1-24, and Figure 9). This translation as taught by Kosaka1 is functionally equivalent to providing two variable bits and a hardwired one bit to an adder, as claimed by the applicant in claim 7. It would be

obvious to one of ordinary skill in the art to use an XOR, ADDER, and other gate logic in DQPSK modulation, because it is well known in the art that an XOR, ADDER and other gate logic provide the correct translation needed to translate two bit symbol into a three bit symbol, using the minimum hardware and software requirements.

As to claim 8, Kosaka2 does not teach mapping the three bit communication bits into DQPSK symbols using a lookup table in DQPSK modulation. Kosaka1 teaches mapping the three bit communication bits into DQPSK symbols using a lookup table in DQPSK modulation (see Kosaka1, columns 7-9, column 10 lines 1-29, and Figure 19). It would be obvious to one of ordinary skill in the art to use a look up table, because it is well known in the art that a look up table can provide the correct translation needed to map the three bit communication bits into DQPSK symbols, using the minimum hardware and software requirements.

As to claims 9 and 16, Kosaka2 does not teach a method of modulation that does not require a complex multiplication operation. Kosaka1 teaches a method of modulation that does not require a complex multiplication operation. Kosaka1 teaches translating the communication bits to three communication bits using an XOR operation (see Kosaka1, column 6, lines 34-68, column 7, lines 1-24, and Figure 9), and teaches mapping the three bit communication bits into DQPSK symbols using a look up table (see Kosaka1, columns 7-9, column 10 lines 1-29, and Figure 19). These two steps of modulation as taught by Kosaka1 do not require a complex multiplication operation. It would be obvious to one of ordinary skill in the art to use an XOR operation and a look up table, because it is well known in the art that these elements can provide the correct translation and mapping needed in DQPSK modulation, using the minimum hardware and software requirements.

8. Claims 3, 4, 13, 18, and 19 rejected under 35 U.S.C. 103(a) as being unpatentable over Kosaka2 in view of Kosaka1 as applied to, respectively, claims 1, 10 and 15 above, and further in view of Dutta (U.S. Patent 5313493) (hereto referred to as Dutta).

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As to claims 3, 13, and 18, Kosaka2 teaches a method for DQPSK demodulation. Kosaka2 does not teach the use of the formula claimed by the applicant in claim 3 in DQPSK demodulation. Dutta teaches translating the Pi/4 DQPSK symbols into QPSK symbols, using the formula $s'(t) = m(t) m(t-\tau) \exp[j\{\Delta\omega t - \Delta\omega(t-\tau)\}]$. Letting $s'(t) = S_{QPSK}(t)$, $m(t) = S(t)$, and $\tau=1$, and using simple calculus, this formula can be equated to the formula claimed by the applicant in claim 3 (see Dutta, column 6 lines 41-45). It would have been obvious to one of ordinary skill in the art to use the formula taught by Dutta in the demodulator taught by Kosaka2, so as to carry out the translation of Pi/4 DQPSK symbols into QPSK symbols.

As to claims 4 and 19, Kosaka2 teaches phase change calculation for demodulation (see Kosaka2, column 3 lines 43-64). This is functionally equivalent to claims 4 and 19 by the applicant.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anika F. Talapatra whose telephone number is 571-272-6039. The examiner can normally be reached on 08:00-16:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on 571-272-3021. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


MOHAMMED GHAYOUR
SUPERVISORY PATENT EXAMINER